

JC20 Rec'd PCT/PTO 29 MAR 2002

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TRADEMARK OFFICE  
(REV. 11-2000)

U.S. DEPARTMENT OF COMMERCE PATENT AND

ATTORNEY'S DOCKET NUMBER

**TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. § 371**

**449122026100**

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)

**10/089318**  
**Not yet assigned**

INTERNATIONAL APPLICATION NO.

INTERNATIONAL FILING DATE

PRIORITY DATE CLAIMED

**PCT/DE00/03328**

**September 25, 2000**

**September 29, 1999**

TITLE OF INVENTION

**METHOD AND DEVICE FOR SWITCHING A CONNECTION IN A COMMUNICATION NETWORK**

APPLICANT(S) FOR DO/EO/US

**Franz EGGER et al.**

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

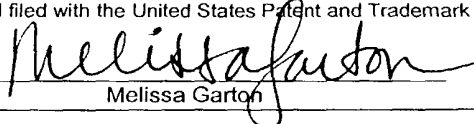
1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☒ is attached hereto (required only if not communicated by the International Bureau).
  - b. ☒ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application under PCT Article 19 (35 U.S.C. 371(c)(2)).
  - a. ☒ is attached hereto.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
  - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

**Items 11. to 16. below concern document(s) or information included:**

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☒ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items: **1) Application Data Sheet; 2) Int'l Search Report; 3) IPER; 4) Return receipt postcard.**

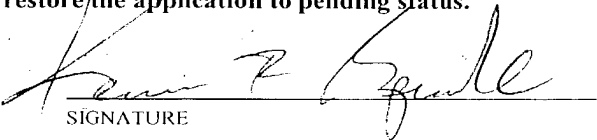
**CERTIFICATE OF HAND DELIVERY**

hereby certify that this correspondence is being hand filed with the United States Patent and Trademark Office in Washington, D.C. on March 29, 2002.

  
Melissa Garton

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29 MAR 2002

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)		INTERNATIONAL APPLICATION NO.		ATTORNEY DOCKET NO.	
Not yet assigned		PCT/DE00/03328		449122026100	
21. <input checked="" type="checkbox"/> The following fees are submitted: <b>BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)):</b> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO.....\$1,040.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO.....\$890.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO.....\$740.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provision of PCT Article 33(1)-(4) .....\$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) .....\$100.00				<b>CALCULATIONS</b> <b>PTO USE ONLY</b>	
<b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>				\$890.00	
Surcharge of <b>\$130.00</b> for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$0	
<b>CLAIMS</b>	<b>NUMBER FILED</b>	<b>NUMBER EXTRA</b>	<b>RATE</b>		
Total claims	- 20 =		x \$18.00	\$0	
Independent claims	- 3 =		x \$84.00	\$0	
<b>MULTIPLE DEPENDENT CLAIM(S) (if applicable)</b>			+ \$280.00	\$0	
<b>TOTAL OF ABOVE CALCULATIONS =</b>				\$890.00	
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$0	
<b>SUBTOTAL =</b>				\$890.00	
Processing fee of <b>\$130.00</b> for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$0	
<b>TOTAL NATIONAL FEE =</b>				\$890.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). <b>\$40.00 per property</b>				\$0	
<b>TOTAL FEES ENCLOSED =</b>				\$890.00	
				<b>Amount to be refunded:</b>	<b>\$</b>
				<b>charged:</b>	<b>\$</b>
a. <input checked="" type="checkbox"/> Please charge my <b>Deposit Account No. 03-1952</b> (referencing Docket No. 449122026100) in the amount of \$890.00 to cover the above fees. A duplicate copy of this sheet is enclosed.					
b. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment to <b>Deposit Account No. 03-1952</b> (referencing Docket No. 449122026100).					
<b>NOTE:</b> Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO:  Kevin R. Spivak Morrison & Foerster LLP 2000 Pennsylvania Avenue, N.W. Washington, D.C. 20006-1888					
<div style="text-align: center;">             SIGNATURE         </div> <div style="text-align: center;">             Kevin R. Spivak              Registration No. 43,148           </div> <div style="text-align: center;">             March 29, 2002           </div>					

10/089318

JC15 Rec'd PCT/PTO 29 MAR 2002

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Melissa Garton

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In the application of:

Franz EGGER et al.

Serial No.: Not yet assigned

Filing Date: March 29, 2002

For: METHOD AND DEVICE FOR  
SWITCHING A CONNECTION IN  
A COMMUNICATION NETWORK

Examiner: Not yet assigned

Group Art Unit: Not yet assigned

**PRELIMINARY AMENDMENT**

**BOX PCT**

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to examination on the merits, please amend this application as follows:

What is claimed is:

1. (Amended) A method for switching a connection between two subscribers of a communication network with a common signaling channel which is independent of information channels and with transit exchanges having at least one switching network and associated line trunk groups, the switching occurring after a request from outside of the communication network, comprising:

connecting two inputs for transmission links at a transit exchange by a data line and allocating at least one pair of information channels;

transmitting a control signal on the common signaling channel such that a connection to a first of the two subscribers is switched through from a first of the information channels allocated to one another, and

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 104

forwarding a terminal signaling of the connection to the first subscriber of the connection to the second subscriber via the common signaling channel, and forwarding a terminal signaling of the connection to the second subscriber of the connection to the first subscriber via the common signaling channel.

2. (Amended) The method as claimed in claim 1, wherein the signaling on the common signaling channel is in accordance with the ITU-T signaling system No. 7.
3. (Amended) The method as claimed in claim 2, wherein the signaling messages of an ISDN User Part are transmitted from the first connection to the second connection and from the second connection to the first connection via the ITU-T signaling system No. 7.
4. (Amended) The method as claimed in claim 1, wherein PCM30 transmission links are used as inputs.
5. (Amended) The method as claimed in claim 1, wherein PCM24 transmission links are used as inputs.
6. (Amended) The method as claimed in claim 1, wherein the control signal is transmitted via an existing controller of the transit exchange.
7. (Amended) The method as claimed in claim 1, wherein a connection after a request from another communication network is initiated by a program installed on a network server which is connected to the other communication network.
8. (Amended) The method as claimed in claim 7, wherein the other communication network is the Internet.

9. (Amended) A device in a transit exchange for switching a connection between two subscribers of a communication network with a common signaling channel which is independent of information channels and with transit exchanges having at least one switching network and associated line trunk groups, the switching occurring after a request from outside of the communication network, comprising:

at least one connection between two inputs for transmission links at the transit exchange by a data line and permanent allocation of at least one pair of information channels; and

a controller connected to the common signaling channel and which conducts on the common signaling channel a control signal having content that a connection is present on one information channel of the information channels allocated to one another, which connection is switched through to a first of the two subscribers, and a connection is present on the second information channel of the information channels allocated to one another, which connection is switched through to a second of the two subscribers, and which forwards the terminal signaling of the connection to the first subscriber to the connection to the second subscriber and from the second subscriber to the first subscriber.

10. (Amended) The device as claimed in claim 9, characterized in that the controller uses the signaling protocol according to the ITU-T signaling system No. 7.

11. (Amended) The device as claimed in claim 10, wherein the controller transmits the end-to-end signaling messages of the ISDN User Part (ISUP) from one connection to the other connection.

12. (Amended) The device as claimed in claim 9, wherein the inputs are those for PCM30 transmission links.

13. (Amended) The device as claimed in claim 9, wherein the inputs are those for PCM24 transmission links.

14. (Amended) The device as claimed in claim 9, wherein the controller is an existing controller of the transit exchange.

15. (Amended) The device as claimed in claim 12, wherein the transit exchange is a transit exchange of the EWSD system and the inputs are connected by two accesses for PCM lines in each case being connected at one line trunk group.

16. (Amended) The device as claimed in claim 15, wherein the controller is a group processor of the line trunk group.

17. (Amended) The device as claimed in claim 9, wherein the controller is connected to a network server which is connected to another communication network to initiate the connection by a program on the network server after a request from the other communication network.

18. (Amended) The device as claimed in claim 17, wherein the other communication network is the Internet.

**In the Abstract:**

Please replace the Abstract with the substitute Abstract attached hereto.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

**REMARKS**

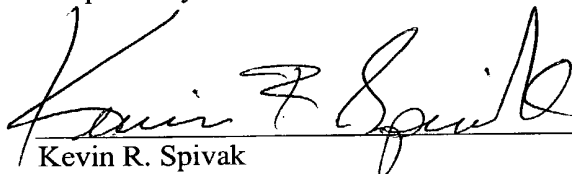
Amendments to the specification have been made and are submitted herewith in the attached Substitute Specification. A clean copy of the specification and a marked-up version showing the changes made are attached herewith. The claims and abstract have been amended in the attached Preliminary Amendment. All amendments have been made to place the application in proper U.S. format and to conform with proper grammatical and idiomatic English. None of the amendments herein are made for reasons related to patentability. No new matter has been added.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned **"Version with markings to show changes made"**.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 449122026100. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

Dated: March 29, 2002

  
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Registration No. 43,148

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Facsimile: (202) 263-8396



2. (Amended) The method as claimed in claim 1, ~~characterized in that~~ **wherein** the signaling on the common signaling channel (6) is effected in accordance with the ITU-T signaling system No. 7.
3. (Amended) The method as claimed in claim 2, ~~characterized in that~~ **wherein** the signaling messages of ~~the~~ **an** ISDN User Part (ISUP) are transmitted from the first connection to the second connection and conversely **from the second connection to the first connection** via the ITU-T signaling system No. 7.
4. (Amended) The method as claimed in ~~one of claims 1 to 3,~~ **characterized in that,** as inputs, those for **claim 1, wherein** PCM30 transmission links are used **as inputs**.
5. (Amended) The method as claimed in ~~one of claims 1 to 3,~~ **characterized in that,** as inputs, those for **claim 1, wherein** PCM24 transmission links are used **as inputs**.
6. (Amended) The method as claimed in ~~one of claims 1 to 5,~~ **characterized in that** **claim 1, wherein** the control signal is transmitted via an existing controller (21) of the transit exchange.
7. (Amended) The method as claimed in ~~one of the preceding claims,~~ **characterized in that** **claim 1, wherein** a connection after a request from another communication network is initiated by a program installed on a network server (13) which is connected to ~~this~~ **the** other communication network.
8. (Amended) The method as claimed in claim 7, ~~characterized in that~~ **wherein** the other communication network is the Internet.
9. (Amended) A device in a transit exchange (3) for switching a connection between two subscribers (7, 8) of a communication network with a common signaling channel (6) which is independent of the information channels (5, 5a, 5b) and with transit exchanges (3) ~~consisting of~~ **in each case having** at least one switching network (4) and associated line trunk groups (17), the

switching being effected **occurring** after a request from outside **of** the communication network, comprising a):

at least one connection between two inputs for transmission links at the transit exchange by means of a data line (12) and permanent allocation of at least one pair of information channels(5a, 5b); **and**

10. (Amended) The device as claimed in claim 9, characterized in that the controller (10) uses the signaling protocol according to the ITU-T signaling system No. 7.

12. (Amended) The device as claimed in ~~one of claims 9 to 11, characterized in that~~  
**claim 9, wherein** the inputs are those for PCM30 transmission links.



[illegible]

## Abstract

10

METHOD AND DEVICE FOR SWITCHING A CONNECTION IN A  
COMMUNICATION NETWORK

CLAIM FOR PRIORITY

- 5 This application claims priority to International  
Application No. PCT/DE00/03328 which was filed in the  
German language on September 25, 2000.

TECHNICAL FIELD OF THE INVENTION

- 10 The present invention relates to a method and device  
for switching a connection between two subscribers of a  
communication network, and in particular, for switching  
a connection from an exchange of the communication  
network using the existing switching functions and  
15 signal transmission functions of the communication  
network.

BACKGROUND OF THE INVENTION

- A connection between two subscribers of a communication  
20 network can be initiated by the two subscribers being  
called separately from a special terminal located  
outside the communication network, using a computer as  
automatic operator. As soon as a connection exists to  
both subscribers and the special terminal, the  
25 information signals and the control signals for service  
indicators, if any, are then transmitted by this  
terminal from one connection to the other and  
conversely. Such a switching method is used in  
telephone networks in call centers. The disadvantageous  
30 factor is the relatively complex implementation and the  
necessary capacity for high performance required from  
the special terminal.

- Such switching of a connection in telephone networks is  
35 of particular interest for the function of "click to  
dial" out of the Internet. "Click to dial" is an offer  
in the Internet in which a user of the Internet is  
provided with the possibility of setting up a  
connection directly by instruction between two



Figure 1 shows in accordance with the prior art the switching of a connection in a communication network by a computer connected to the communication network as terminal which is used as automatic operator 9. The communication network transit exchanges 3 and some access exchanges 4. An exchange center can have both functions and can be both transit exchange 3 and access exchange 4. The transit exchanges are connected to one another by means of transmission links which have at least one information channel 5 and at least one separate signaling channel 6. Figure 1 shows the connection between a first subscriber 7 and a second subscriber 8 by the automatic operator 9. The automatic operator 9 first dials both subscribers 7, 8 in two separate connections via two terminal lines 14. In the example shown, both connections initially take the same path. From the access exchange 4 of the automatic operator 9, they first reach the same transit exchange 3. Depending on the subscriber 7, 8 dialed, the connections can also take separate paths through the communication network after the access exchange 4 to which the automatic operator 9 is connected. In the transit exchange 3, the two connections are switched through completely independently as two different ones. This happens by the information channels 5 and signaling channels 6 being conducted via line trunk groups 2 in the transit exchange 3 and being switched through in a switching network 1 according to the control signals in the signaling channels 6.

If the two connections to the first subscriber 7 and second subscriber 8 have been established, the automatic operator 9 connects the two connections.

#### 35                    SUMMARY OF THE INVENTION

In one embodiment of the invention, there is a method for switching a connection between two subscribers of a communication network with a common signaling channel which is independent of the



- 5 -

network server which is connected to the other communication network.

In another aspect of the invention, the other communication network is the Internet.

In another embodiment of the invention, there is a device in a transit exchange for switching a connection between two subscribers of a communication network with a common signaling channel which is independent of the information channels and with transit exchanges having at least one switching network and associated line trunk groups, the switching occurring after a request from outside of the communication network. The device includes, for example, at least one connection between two inputs for transmission links at the transit exchange by a data line and permanent allocation of at least one pair of information channels, a controller connected to the common signaling channel and which conducts on the common signaling channel a control signal having content that a connection is present on one information channel of the information channels in each case allocated to one another, which connection is switched through to one subscriber, and a connection is present on the second information channel of the information channels allocated to one another, which connection is switched through to the second subscriber, and which forwards the terminal signaling of the connection to the first subscriber to the connection to the second subscriber and from the second subscriber to the first subscriber.

In another aspect of the invention, the controller uses the signaling protocol according to the ITU-T signaling system No. 7.

In another aspect of the invention, the controller transmits the end-to-end signaling messages of the ISDN User Part (ISUP) from one connection to the other connection.

In yet another aspect of the invention, the inputs are those for PCM30 transmission links.

In another aspect of the invention, the inputs are

those for PCM24 transmission links.

In another aspect of the invention, the controller is an existing controller of the transit exchange.

In still another aspect of the invention, the transit exchange is a transit exchange of the EWSD system and the inputs are connected by two accesses for PCM lines in each case being connected at one line trunk group.

In another aspect of the invention, the controller is a group processor of the line trunk group.

In another aspect of the invention, the controller is connected to a network server which is connected to another communication network to initiate the connection by a program on the network server after a request from the other communication network.

In yet another aspect of the invention, the other communication network is the Internet.

#### BRIEF DESCRIPTION OF THE DRAWINGS

5 In the text which follows, the invention will be explained with reference to the figures in which:

Figure 1 shows the connection of two subscribers by a third party according to the prior art, by a computer  
10 as terminal of the network.

Figure 2 shows the connection between two subscribers by a third party by means of the device according to the invention.  
15

Figure 3 shows an embodiment according to the invention of the device in a transit exchange EWSD.

#### 20 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The invention provides a method and a device by means of which it is possible without elaborate adaptations of the transit exchanges and the modules and facilities used in them to establish a connection between two

subscribers of the network from one point of the network after a request from a third party.

According to one embodiment of the invention, there is  
5 a method for switching a connection between two subscribers in a communication network with a common signaling channel which is independent of the information channels and with transit exchanges including at least one switching network and associated  
10 line trunk groups is provided, the switching being effected after the connection has been requested from a third party.

Initially, two inputs for transmission links at a  
15 transit exchange are connected by a data line. This can already been done by means of a signal data line. This also results in a permanent allocation of the information data channels in pairs, for example the voice channels in a telephone network. In networks  
20 operating with a synchronous digital hierarchy or a plesiochronous digital hierarchy on the transmission links or generally in the case of multiplex lines, at least one information channel of one input is permanently allocated to an information channel of the  
25 other input of the transmission link via the corresponding timeslot. Naturally, it is also possible, in an ATM network, to achieve a fixed paired information channel allocation by means of such a hardware connection of the inputs of transmission links  
30 by utilizing the coding and decoding methods provided by the network since for each transit exchange a transmission link, which, in turn, is connected to the exchange itself, acts in such a manner as if it were connected to an adjacent transit exchange. Thus, the  
35 methods already in existence produce a fixed information channel allocation since an unambiguous defined information channel allocation must also exist between transit exchanges.

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In one aspect of the invention, the ITU-T signaling

In another aspect of the invention, the signaling  
5 messages of the ISDN User Part (ISUP) are  
advantageously transmitted from the first connection to  
the second connection and conversely via the ITU-T  
signaling system No. 7.

It is also advantageous to use as inputs those for transmission links of the PCM30 or PCM 24 type of construction. Since these two types of transmission links are in most cases used in existing transit exchanges, corresponding inputs exist. As a result, it is possible in a relatively simple way to apply the method described to transit exchanges already in existence.

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In one embodiment, a device in a transit exchange is provided for switching a connection between two subscribers in a communication network. The communication network exhibits a common signaling



- 11 -

The device can also advantageously be installed in preexisting transit exchanges.

5 The controller advantageously uses the signaling protocol according to the ITU-T signaling system No. 7.

10 According to another aspect, the controller advantageously transmits the end-to-end signaling messages of the ISDN User Part (ISUP) from one connection to the other one and conversely.

It is also preferable to provide a data line between two inputs for PCM30 transmission links.

15 It is also preferable to provide a data line between two inputs for PCM24 transmission links.

The device can be simplified if the controller (CTD controller) is an existing controller of the transit exchange.

20 According to another aspect of the invention, it is preferable to provide the device in a transit exchange of the EWSD system. The inputs are then connected by two inputs for PCM lines in each case being connected at one line trunk group (LTG-C).

25 The group processor of the access section of the transit exchange according to the EWSD system can be provided as controller (CTD controller). Advantageously, no external additional controller is then needed since the one existing in the line trunk group has sufficient capacity also to serve as controller of the device proposed here.

35 The controller can be connected to a computer which, in turn, is connected to another communication network in order to initiate the connection by a program on this computer after a request from the other communication network.

The other communication network is advantageously the Internet and the "click to dial" feature is implemented thereby.

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Figure 2, in contrast to Figure 1, shows by way of example the arrangement of a device according to the invention for switching a first subscriber 7 and a second subscriber 8 in an embodiment with request of the connection by a network server 13, for example of the Internet. The drawing also shows an embodiment in which the device according to the invention is integrated in a transit exchange 3. In a transit exchange 3 including the main modules switching network 1 and line trunk groups 2, two transmission links are connected by a data line 12 and thus at least two information channels 5 are permanently allocated to one another via the data line 12. The associated signaling channels 6 are connected to a controller (CtD controller - click to dial controller) 10. In the embodiment shown, this controller is one of the controllers already existing in the transit exchange 3 for controlling the transit exchange 3 itself. The controller 10 is connected to a network server 13 via a junction line 11. The network server 13 can then be connected to another communication network, for example the Internet. If the network server 13 then receives a request for setting up a connection between the first subscriber 7 and the second subscriber 8, it issues the instruction for this via the junction line 11 to the controller 10. The controller 10 then conducts a control signal to the signaling channel 6 that a connection is present on the information channel 5 connected to the data line 12 which is to be switched through to the first subscriber 7 and which, lastly, is connected via the switching network 1 to the first subscriber. Similarly, a connection is switched from the data line 12 to the second subscriber 8 via the switching network 1 by means of a corresponding control

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- 13 -

signal on the signaling channel 6. Since the transit  
 exchange 3 sees itself as an adjacent transit exchange  
 via the information channels 5 and the data line 12,  
 the information channels 5 are permanently allocated to  
 5 one another via the synchronizing devices and methods  
 normally existing between the transit exchanges and  
 transmit the information data. The controller 10 also  
 transmits, on the signaling channel 6, terminal  
 signaling messages coming from the connection to the  
 10 first subscriber 7 to the connection to the second  
 subscriber 8 and conversely.

Compared with the prior art, the embodiment of the  
 device according to the invention described has the  
 15 advantage that it can be set up with little expenditure  
 and also subsequently in an existing transit exchange  
 3. It is only necessary to install the data line 12, to  
 supplement an existing controller by software  
 adaptation to the controller 10 and to set up an  
 20 interface as junction line 11 to a network server 13.  
 This can also be done by utilizing existing system  
 interfaces to the outside.

Figure 3 shows in a simplified manner a further  
 25 embodiment according to the invention of the device  
 described above in a transit exchange of the EWSD type.

A transit exchange of the EWSD type consists of a  
 switching network 1 (SN) and at least one line trunk  
 30 group 2 (LTG). In this case, four are shown, one of  
 which is drawn enlarged and with its modules. The  
 switching network 1 has, for the control function, its  
 own controller, the switch group control 15 (SGC). A  
 line trunk group 2 is built up of line trunk units 17  
 35 (DIU, LTU), a group switch 19 and a line interface unit  
 20. If the line trunk group 2 is designed for PCM30  
 transmission links as in the embodiment shown, the line  
 trunk group 2 has four line trunk units 17. Each line  
 trunk unit 17 provides a PCM30 access 22 for a

- 14 -

transmission link. In each case two of the PCM30  
 accesses 22 are connected to one another by data lines  
 12. The group processor 21 is at the same time the  
 signal processor 10. The line trunk units 17 combine  
 5 the information channels in a group switch 19 (GS).  
 Four 2-MBit PCM lines of 32 information channels each  
 are combined in the group switch 19 to form an 8-MBit  
 line with 128 channels which are forwarded to the  
 switching network 1 via the interface of the line  
 10 interface unit 20. The connection is set up as already  
 described above. Since the group processor 21 is  
 connected to the processor of the switching network 1,  
 the switch group control 15 and the central processor  
 16 via internal interfaces, it can be used as  
 15 controller 10. The software must be appropriately  
 adapted. The instruction for setting up a connection to  
 the controller 10 can also be transmitted via these  
 interfaces. Using the embodiment described, it is,  
 therefore, possible to establish the device according  
 20 to the invention by means of two data lines 12 and a  
 software supplement. In particular, subsequent  
 installation in existing transit exchanges EWSD which  
 are used in large numbers is also conceivable.

## Description

METHOD AND DEVICE FOR SWITCHING A CONNECTION IN A  
COMMUNICATION NETWORK

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CLAIM FOR PRIORITY

This application claims priority to International  
Application No. PCT/DE00/03328 which was filed in the  
German language on September 25, 2000.

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TECHNICAL FIELD OF THE INVENTION

The present invention relates to a method and to a device for switching a connection between two subscribers of a communication network, e.g. a telephone network, and in particular, for switching a connection from an exchange of the communication network, ~~after a request coming from a position outside this communication network, for example from the Internet,~~ using the existing switching functions and signal transmission functions of the communication network.

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BACKGROUND OF THE INVENTION

A ~~It is known to initiate a connection between two subscribers of a communication network~~ can be initiated by the two subscribers being called separately ~~in each case from a special terminal located outside the communication network,~~ using a computer as automatic operator. As soon as a connection exists to both subscribers and the special terminal, the information signals and the control signals for service indicators, if any, are then transmitted by this terminal from one connection to the other and conversely. Such a switching method is used in telephone networks in call centers. The disadvantageous factor is the relatively complex implementation and the necessary capacity for high performance required from the special terminal.

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Such switching of a connection in telephone networks is of particular interest for the function of "click to

- 2 -

dial" out of the Internet. "Click to dial" is an offer in the Internet in which a user of the Internet is provided with the possibility of setting up a connection directly by instruction between two subscriber numbers of the telephone network, the telephone numbers of which are input or retrieved from a database. Both lines involved must be dialed for this and connected to one another. In most cases, one subscriber is the Internet user himself.

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If this function is implemented similar to the call switching in call centers, a controller operating as terminal of the communication network ~~must initiate~~ initiates two connections via the communication network

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~~here, too,~~ and, as soon as both connections exist, the controller must ~~forward~~ forwards the information data, ~~that is to say. That is,~~ the digitized voice or other data to be transmitted, of one connection via the other one and conversely. To maintain the features offered by

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the communication system used in the communication network, e.g. the service indicators of the ISDN in the telephone network, for both subscribers of the initially different connections, ~~these, too,~~ must be transferred from one connection to the second one and

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adapted, if necessary. This creates considerable expenditure since the computer receives the service indicators like a terminal and forwards them again to the second corresponding connection like a terminal. Additional computing effort is produced by the fact

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that some data have to be converted and adapted. In the ISDN, for example, it is possible to indicate the telephone number of the other subscriber by means of the CLIP feature. Since there are two connections from the point of view of the communication network, the

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second call must receive from the controller the indicator of the telephone number of the first call instead of that belonging to the controller, in order to guarantee this feature.

It is also desirable to have a capability of integrating the "click to dial" service with the simplest possible means also in existing network nodes in the case where a network operator itself offers this service.

Figure 1 shows in accordance with the prior art the switching of a connection in a communication network by a computer connected to the communication network as terminal which is used as automatic operator 9. The communication network includes transit exchanges 3 and some access exchanges 4. An exchange center can have both functions and can be both transit exchange 3 and access exchange 4. The transit exchanges are connected to one another by means of transmission links which have at least one information channel 5 and at least one separate signaling channel 6. Figure 1 shows the connection between a first subscriber 7 and a second subscriber 8 by the automatic operator 9. The automatic operator 9 first dials both subscribers 7, 8 in two separate connections via two terminal lines 14. In the example shown, both connections initially take the same path. From the access exchange 4 of the automatic operator 9, they first reach the same transit exchange 3. Depending on the subscriber 7, 8 dialed, the connections can also take separate paths through the communication network after the access exchange 4 to which the automatic operator 9 is connected. In the transit exchange 3, the two connections are switched through completely independently as two different ones. This happens by the information channels 5 and signaling channels 6 being conducted via line trunk groups 2 in the transit exchange 3 and being switched through in a switching network 1 according to the control signals in the signaling channels 6.

If the two connections to the first subscriber 7 and second subscriber 8 have been established, the automatic operator 9 connects the two connections.

# SUMMARY OF THE INVENTION

In one embodiment of the invention, there is a method for switching ~~The invention is, therefore, based on the object of providing a method and a device by means of which it is possible without elaborate adaptations of the transit exchanges and the modules and facilities used in them to establish a connection between two subscribers of~~ a communication network with a common signaling channel which is independent of the information channels and with transit exchanges having at least one switching occurring network and associated line trunk groups, the switching being effected after a request from outside of the communication network. The method includes, for example, connecting two inputs for transmission links at a transit exchange by a data line and permanently allocating at least one pair of information channels. transmitting a control signal on the common signaling channel such that a connection to the first subscriber is switched through from one information channel of the information channels in each case allocated to one another, and a connection is switched through to the second subscriber from the second information channel of the information channels allocated to one another, and forwarding a terminal signaling of the connection to the first subscriber to the connection to the second subscriber via the common signaling channel, and forwarding a terminal signaling of the connection to the second subscriber to the connection to the first subscriber via the common signaling channel.

In another aspect of the invention, the signaling on the common signaling channel is in accordance with the ITU-T signaling system No. 7.

In another aspect of the invention, the signaling messages of an ISDN User Part (ISUP) are transmitted from the first connection to the second connection and from the second connection to the first connection via the ITU-T signaling system No. 7.

In yet another aspect of the invention, PCM30

transmission links are used as inputs.

In another aspect of the invention, PCM24 transmission links are used as inputs.

In another aspect of the invention, the control signal is transmitted via an existing controller of the transit exchange.

In still another aspect of the invention, a connection after a request from another communication network is initiated by a program installed on a network server which is connected to the other communication network.

In another aspect of the invention, the other communication network is the Internet.

In another embodiment of the invention, there is a device in a transit exchange for switching a connection between two subscribers of a communication network with a common signaling channel which is independent of the information channels and with transit exchanges having at least one switching network and associated line trunk groups, the switching occurring after a request from outside of the communication network. The device includes, for example, at least one connection between two inputs for transmission links at the transit exchange by a data line and permanent allocation of at least one pair of information channels, a controller connected to the common signaling channel and which conducts on the common signaling channel a control signal having content that a connection is present on one information channel of the information channels in each case allocated to one another, which connection is switched through to one subscriber, and a connection is present on the second information channel of the information channels allocated to one another, which connection is switched through to the second subscriber, and which forwards the terminal signaling of the connection to the first subscriber to the connection to the second subscriber and from the second subscriber to the first subscriber.

In another aspect of the invention, the controller



Figure 3 shows an embodiment according to the invention of the device in a transit exchange EWSD.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

5 The invention provides a method and a device by means of which it is possible without elaborate adaptations of the transit exchanges and the modules and facilities used in them to establish a connection between two subscribers of the network from one point of the  
10 network after a request from a third party.

~~According to the invention, the object described above is achieved by the features of the independent claims 1 and 9. The dependent claims advantageously develop the~~  
15 ~~basic concept of the invention and provide advantageous embodiments and methods.~~

~~According to the invention, according to claim 1,~~  
According to one embodiment of the invention, there is  
20 a method for switching a connection between two subscribers in a communication network with a common signaling channel which is independent of the information channels and with transit exchanges  
~~consisting of in each case~~ including at least one  
25 switching network and associated line trunk groups is provided, the switching being effected after the connection has been requested from a third party.

Initially, two inputs for transmission links at a  
30 transit exchange are connected by a data line. This can already been done by means of a signal data line. This also results in a permanent allocation of the information data channels in ~~each case in~~ pairs, for example the voice channels in a telephone network. In  
35 networks operating with a synchronous digital hierarchy or a plesiochronous digital hierarchy on the transmission links or generally in the case of multiplex lines, ~~in each case~~ at least one information channel of one input is permanently allocated to an



be secured between the terminals by a simple forwarding of the terminal signaling. If, for example, the call number of one subscriber is transmitted via the signaling and forwarded to the other connection via the common signaling channel, the desired result is obtained without further translation of the signaling. Transmission of the information data does not require any expenditure since the transit exchange in the method according to the invention sees itself as an apparent adjacent transit exchange and, as a result, ensures synchronization of the information channels and transmission of the information data by means of the preexisting methods and devices.

~~According to claim 2~~ In one aspect of the invention, the ITU-T signaling system No. 7 is advantageously used for the signaling on the common signaling channel.

~~According to claim 3~~ In another aspect of the invention, the signaling messages of the ISDN User Part (ISUP) are advantageously transmitted from the first connection to the second connection and conversely via the ITU-T signaling system No. 7.

The control signals are advantageously preferably generated by an existing controller of the transit exchange and forwarded to the common signaling channel. As a result, the method described can be applied with little expenditure by a corresponding program without needing an additional controller if the computing power of existing controllers is adequate.

~~Furthermore, it~~ It is also advantageous to use as inputs those for transmission links of the PCM30 or PCM 24 type of construction. Since these two types of transmission links are in most cases used in existing transit exchanges, corresponding inputs exist. As a result, it is possible in a relatively simple way to apply the method described to transit exchanges already



- 11 -

The controller forwards the terminal signaling of the connection to the first subscriber to the connection to the second subscriber and conversely.

5 ~~Advantageously,~~ a A connection between two subscribers of the communication network can be set up with ~~only~~ little expenditure since it is ~~only~~ the computing effort for generating the signals of the common signaling channel and the transmission of the terminal  
10 signaling by the controller which ~~must be~~ are produced. The transit exchange in the device according to the invention sees itself as an apparent adjacent transit exchange and the synchronization of the information data and the permanent allocation of the information  
15 channels is thus effected with the existing means of the transit exchange.

The device can also advantageously be installed in preexisting transit exchanges.

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The controller advantageously uses the signaling protocol according to the ITU-T signaling system No. 7.

25 According to ~~claim 11~~ another aspect, the controller advantageously transmits the end-to-end signaling messages of the ISDN User Part (ISUP) from one connection to the other one and conversely.

30 It is also advantageous preferable to provide a data line between two inputs for PCM30 transmission links.

It is also advantageous preferable to provide a data line between two inputs for PCM24 transmission links. The device can be simplified if the controller (CTD  
35 controller) is an existing controller of the transit exchange.

According to ~~claim 15~~, according to another aspect of the invention, it is advantageous preferable to provide

the device in a transit exchange of the EWSD system. The inputs are then connected by two inputs for PCM lines in each case being connected at one line trunk group (LTG-C).

5

The group processor of the access section of the transit exchange according to the EWSD system can be provided as controller (CTD controller). Advantageously, no external additional controller is  
10 then needed since the one existing in the line trunk group has sufficient capacity also to serve as controller of the device proposed here.

The controller can be connected to a computer which, in  
15 turn, is connected to another communication network in order to initiate the connection by a program on this computer after a request from the other communication network.

20 The other communication network is advantageously the Internet and the "click to dial" feature is implemented thereby.

~~In the text which follows, the invention will be  
25 explained with reference to figures 1 and 2, in which:~~

~~figure 1 shows in a diagram the connection of two  
subscribers by a third party according to the prior  
art, by a computer as terminal of the network.~~

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~~figure 2 shows in a diagram the connection between two  
subscribers by a third party by means of the device  
according to the invention,~~

35 ~~figure 3 shows in a greatly simplified manner an  
embodiment according to the invention of the device in  
a transit exchange EWSD.~~

~~Figure 1 diagrammatically shows in accordance with the~~

prior art the switching of a connection in a communication network by a computer connected to the communication network as terminal which is used as automatic operator 9. The communication network  
5 consists of transit exchanges 3 and some access exchanges 4. An exchange center can have both functions and can be both transit exchange 3 and access exchange 4. The transit exchanges are connected to one another by means of transmission links which have at least one  
10 information channel 5 and at least one separate signaling channel 6. Figure 1 shows the connection between a first subscriber 7 and a second subscriber 8 by the automatic operator 9. The automatic operator 9 first dials both subscribers 7, 8 in two separate  
15 connections via two terminal lines 14. In the example shown, both connections initially take the same path. From the access exchange 4 of the automatic operator 9, they first reach the same transit exchange 3. Depending on the subscriber 7, 8 dialed, the connections can also  
20 take separate paths through the communication network after the access exchange 4 to which the automatic operator 9 is connected. In the transit exchange 3, the two connections are switched through completely independently as two different ones. This happens by  
25 the information channels 5 and signaling channels 6 being conducted via line trunk groups 2 in the transit exchange 3 and being switched through in a switching network 1 according to the control signals in the signaling channels 6.

30 If the two connections to the first subscriber 7 and second subscriber 8 have been established, the automatic operator 9 connects the two connections.

35 Figure 2, in contrast to Figure 1, shows by way of example the arrangement of a device according to the invention for switching a first subscriber 7 and a second subscriber 8 in an embodiment with request of the connection by a network server 13, for example of

- 14 -

the Internet. The drawing also shows an embodiment in  
 which the device according to the invention is  
 integrated in a transit exchange 3. In a transit  
 exchange 3 ~~consisting of~~ including the main modules  
 5 switching network 1 and line trunk groups 2, two  
 transmission links are connected by a data line 12 and  
 thus at least two information channels 5 are  
 permanently allocated to one another via the data line  
 12. The associated signaling channels 6 are connected  
 10 to a controller (CtD controller - click to dial  
 controller) 10. In the embodiment shown, this  
 controller is one of the controllers already existing  
 in the transit exchange 3 for controlling the transit  
 exchange 3 itself. The controller 10 is connected to a  
 15 network server 13 via a junction line 11. The network  
 server 13 can then be connected to another  
 communication network, for example the Internet. If the  
 network server 13 then receives a request for setting  
 up a connection between the first subscriber 7 and the  
 20 second subscriber 8, it issues the instruction for this  
 via the junction line 11 to the controller 10. The  
 controller 10 then conducts a control signal to the  
 signaling channel 6 that a connection is present on the  
 information channel 5 connected to the data line 12  
 25 which is to be switched through to the first subscriber  
 7 and which, lastly, is connected via the switching  
 network 1 to the first subscriber. Similarly, a  
 connection is switched from the data line 12 to the  
 second subscriber 8 via the switching network 1 by  
 30 means of a corresponding control signal on the  
 signaling channel 6. Since the transit exchange 3 sees  
 itself as an adjacent transit exchange via the  
 information channels 5 and the data line 12, the  
 information channels 5 are permanently allocated to one  
 35 another via the synchronizing devices and methods  
 normally existing between the transit exchanges and  
 transmit the information data. The controller 10 also  
 transmits, on the signaling channel 6, terminal  
 signaling messages coming from the connection to the

- 15 -

first subscriber 7 to the connection to the second subscriber 8 and conversely.

Compared with the prior art, the embodiment of the  
 5 device according to the invention described has the  
 advantage that it can be set up with little expenditure  
 and also subsequently in an existing transit exchange  
 3. It is only necessary to install the data line 12, to  
 supplement an existing controller by software  
 10 adaptation to the controller 10 and to set up an  
 interface as junction line 11 to a network server 13.  
 This can also be done by utilizing existing system  
 interfaces to the outside.

15 Figure 3 shows in a simplified manner a further  
 embodiment according to the invention of the device  
 described above in a transit exchange of the EWSD type.

A transit exchange of the EWSD type consists of a  
 20 switching network 1 (SN) and at least one line trunk  
 group 2 (LTG). In this case, four are shown, one of  
 which is drawn enlarged and with its modules. The  
 switching network 1 has, for the control function, its  
 own controller, the switch group control 15 (SGC). A  
 25 line trunk group 2 is built up of line trunk units 17  
 (DIU, LTU), a group switch 19 and a line interface unit  
 20. If the line trunk group 2 is designed for PCM30  
 transmission links as in the embodiment shown, the line  
 trunk group 2 has four line trunk units 17. Each line  
 30 trunk unit 17 provides a PCM30 access 22 for a  
 transmission link. In each case two of the PCM30  
 accesses 22 are connected to one another by data lines  
 12. The group processor 21 is at the same time the  
 signal processor 10. The line trunk units 17 combine  
 35 the information channels in a group switch 19 (GS).  
 Four 2-MBit PCM lines of 32 information channels each  
 are combined in the group switch 19 to form an 8-MBit  
 line with 128 channels which are forwarded to the  
 switching network 1 via the interface of the line

- 16 -

interface unit 20. The connection is set up as already described above. Since the group processor 21 is connected to the processor of the switching network 1, the switch group control 15 and the central processor 5 16 via internal interfaces, it can be used as controller 10. The software must be appropriately adapted. The instruction for setting up a connection to the controller 10 can also be transmitted via these interfaces. Using the embodiment described, it is, 10 therefore, possible to establish the device according to the invention by means of two data lines 12 and a software supplement. In particular, subsequent installation in existing transit exchanges EWSD which are used in large numbers is also conceivable.

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1009 10/08 9318

JC15 Rec'd PCT/PTO 29 MAR 2002

Description

Method and device for switching a connection in a communication network

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The present invention relates to a method and to a device for switching a connection between two subscribers of a communication network, e.g. a telephone network, from an exchange of the communication network, after a request coming from a position outside this communication network, for example from the Internet, using the existing switching functions and signal transmission functions of the communication network.

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It is known to initiate a connection between two subscribers of a communication network by the two subscribers being called separately in each case from a special terminal located outside the communication network, a computer as automatic operator. As soon as a connection exists to both subscribers and the special terminal, the information signals and the control signals for service indicators, if any, are then transmitted by this terminal from one connection to the other and conversely. Such a switching method is used in telephone networks in call centers. The disadvantageous factor is the relatively complex implementation and the necessary capacity for high performance required from the special terminal.

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Such switching of a connection in telephone networks is of particular interest for the function of "click to dial" out of the Internet. "Click to dial" is an offer in the Internet in which a user of the Internet is provided with the possibility of setting up a connection directly by instruction between two subscriber numbers of the telephone network, the telephone numbers of which are input or retrieved from a database. Both lines involved must be dialed for this

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- 3 -

providing a method and a device by means of which it is possible without elaborate adaptations of the transit exchanges and the modules and facilities used in them to establish a connection between two subscribers of  
 5 the network from one point of the network after a request from a third party.

According to the invention, the object described above is achieved by the features of the independent claims 1  
 10 and 9. The dependent claims advantageously develop the basic concept of the invention and provide advantageous embodiments and methods.

According to the invention, according to claim 1, a  
 15 method for switching a connection between two subscribers in a communication network with a common signaling channel which is independent of the information channels and with transit exchanges consisting of in each case at least one switching  
 20 network and associated line trunk groups is provided, the switching being effected after the connection has been requested from a third party.

Initially, two inputs for transmission links at a  
 25 transit exchange are connected by a data line. This can already been done by means of a signal data line. This also results in a permanent allocation of the information data channels in each case in pairs, for example the voice channels in a telephone network. In  
 30 networks operating with a synchronous digital hierarchy or a plesiochronous digital hierarchy on the transmission links or generally in the case of multiplex lines, in each case at least one information channel of one input is permanently allocated to an  
 35 information channel of the other input of the transmission link via the corresponding timeslot. Naturally, it is also possible, in an ATM network, to achieve a fixed paired information channel allocation by means of such a hardware connection of the inputs of







- 7 -

effort for generating the signals of the common  
 signaling channel and the transmission of the terminal  
 signaling by the controller which must be produced. The  
 transit exchange in the device according to the  
 5 invention sees itself as an apparent adjacent transit  
 exchange and the synchronization of the information  
 data and the permanent allocation of the information  
 channels is thus effected with the existing means of  
 the transit exchange.

10

The device can also advantageously be installed in  
 preexisting transit exchanges.

15 The controller advantageously uses the signaling  
 protocol according to the ITU-T signaling system No. 7.

According to claim 11, the controller advantageously  
 transmits the end-to-end signaling messages of the ISDN  
 User Part (ISUP) from one connection to the other one  
 20 and conversely.

It is also advantageous to provide a data line between  
 two inputs for PCM30 transmission links.

25 It is also advantageous to provide a data line between  
 two inputs for PCM24 transmission links.

The device can be simplified if the controller (CTD  
 controller) is an existing controller of the transit  
 30 exchange.

According to claim 15, according to the invention, it  
 is advantageous to provide the device in a transit  
 exchange of the EWSD system. The inputs are then  
 35 connected by two inputs for PCM lines in each case  
 being connected at one line trunk group (LTG-C).

The group processor of the access section of the  
 transit exchange according to the EWSD system can be



- 9 -

and can be both transit exchange 3 and access exchange  
 4. The transit exchanges are connected to one another  
 by means of transmission links which have at least one  
 information channel 5 and at least one separate  
 5 signaling channel 6. Figure 1 shows the connection  
 between a first subscriber 7 and a second subscriber 8  
 by the automatic operator 9. The automatic operator 9  
 first dials both subscribers 7, 8 in two separate  
 connections via two terminal lines 14. In the example  
 10 shown, both connections initially take the same path.  
 From the access exchange 4 of the automatic operator 9,  
 they first reach the same transit exchange 3. Depending  
 on the subscriber 7, 8 dialed, the connections can also  
 take separate paths through the communication network  
 15 after the access exchange 4 to which the automatic  
 operator 9 is connected. In the transit exchange 3, the  
 two connections are switched through completely  
 independently as two different ones. This happens by  
 the information channels 5 and signaling channels 6  
 20 being conducted via line trunk groups 2 in the transit  
 exchange 3 and being switched through in a switching  
 network 1 according to the control signals in the  
 signaling channels 6.

25 If the two connections to the first subscriber 7 and  
 second subscriber 8 have been established, the  
 automatic operator 9 connects the two connections.

Figure 2, in contrast, shows by way of example the  
 30 arrangement of a device according to the invention for  
 switching a first subscriber 7 and a second subscriber  
 8 in an embodiment with request of the connection by a  
 network server 13, for example of the Internet. The  
 drawing also shows an embodiment in which the device  
 35 according to the invention is integrated in a transit  
 exchange 3. In a transit exchange 3 consisting of the  
 main modules switching network 1 and line trunk groups  
 2, two transmission links are connected by a data line  
 12 and thus at least two information channels 5 are

- 10 -

permanently allocated to one another via the data line 12. The associated signaling channels 6 are connected to a controller (CtD controller - click to dial controller) 10. In the embodiment shown, this controller is one of the controllers already existing in the transit exchange 3 for controlling the transit exchange 3 itself. The controller 10 is connected to a network server 13 via a junction line 11. The network server 13 can then be connected to another communication network, for example the Internet. If the network server 13 then receives a request for setting up a connection between the first subscriber 7 and the second subscriber 8, it issues the instruction for this via the junction line 11 to the controller 10. The controller 10 then conducts a control signal to the signaling channel 6 that a connection is present on the information channel 5 connected to the data line 12 which is to be switched through to the first subscriber 7 and which, lastly, is connected via the switching network 1 to the first subscriber. Similarly, a connection is switched from the data line 12 to the second subscriber 8 via the switching network 1 by means of a corresponding control signal on the signaling channel 6. Since the transit exchange 3 sees itself as an adjacent transit exchange via the information channels 5 and the data line 12, the information channels 5 are permanently allocated to one another via the synchronizing devices and methods normally existing between the transit exchanges and transmit the information data. The controller 10 also transmits, on the signaling channel 6, terminal signaling messages coming from the connection to the first subscriber 7 to the connection to the second subscriber 8 and conversely.

35

Compared with the prior art, the embodiment of the device according to the invention described has the advantage that it can be set up with little expenditure and also subsequently in an existing transit exchange

- 11 -

3. It is only necessary to install the data line 12, to supplement an existing controller by software adaptation to the controller 10 and to set up an interface as junction line 11 to a network server 13.  
 5 This can also be done by utilizing existing system interfaces to the outside.

Figure 3 shows in a simplified manner a further embodiment according to the invention of the device  
 10 described above in a transit exchange of the EWSD type.

A transit exchange of the EWSD type consists of a switching network 1 (SN) and at least one line trunk group 2 (LTG). In this case, four are shown, one of  
 15 which is drawn enlarged and with its modules. The switching network 1 has, for the control function, its own controller, the switch group control 15 (SGC). A line trunk group 2 is built up of line trunk units 17 (DIU,LTU), a group switch 19 and a line interface unit  
 20 20. If the line trunk group 2 is designed for PCM30 transmission links as in the embodiment shown, the line trunk group 2 has four line trunk units 17. Each line trunk unit 17 provides a PCM30 access 22 for a transmission link. In each case two of the PCM30  
 25 accesses 22 are connected to one another by data lines 12. The group processor 21 is at the same time the signal processor 10. The line trunk units 17 combine the information channels in a group switch 19 (GS). Four 2-MBit PCM lines of 32 information channels each  
 30 are combined in the group switch 19 to form an 8-MBit line with 128 channels which are forwarded to the switching network 1 via the interface of the line interface unit 20. The connection is set up as already described above. Since the group processor 21 is  
 35 connected to the processor of the switching network 1, the switch group control 15 and the central processor 16 via internal interfaces, it can be used as controller 10. The software must be appropriately adapted. The instruction for setting up a connection to

the controller 10 can also be transmitted via these interfaces. Using the embodiment described, it is, therefore, possible to establish the device according to the invention by means of two data lines 12 and a software supplement. In particular, subsequent installation in existing transit exchanges EWSD which are used in large numbers is also conceivable.

Patent claims

1. A method for switching a connection between two subscribers (7, 8) of a communication network with a common signaling channel (6) which is independent of the information channels (5, 5a, 5b) and with transit exchanges (3) consisting of in each case at least one switching network (1) and associated line trunk groups (2), the switching being effected after a request from outside this communication network, comprising the following steps

a) connecting two inputs for transmission links at a transit exchange (3) by a data line (12) and permanently allocating at least one pair of information channels (5a, 5b).

b) Transmitting a control signal on the common signaling channel (6) which has the following effect:

that a connection to the first subscriber (7) is switched through from one information channel (5a) of the information channels (5a, 5b) in each case permanently allocated to one another, and

that a connection is switched through to the second subscriber (8) from the second information channel (5b) of the information channels (5a, 5b) permanently allocated to one another.

c) Forwarding the terminal signaling of the connection to the first subscriber to the connection to the second subscriber via the common signaling channel (6) and conversely.

2. The method as claimed in claim 1, characterized in that the signaling on the common signaling channel (6) is effected in accordance with the ITU-T signaling system No. 7.

3. The method as claimed in claim 2, characterized in that

a) at least one connection between two inputs for transmission links at the transit exchange by means of a data line (12) and permanent allocation of at least

- 15 -

one pair of information channels (5a, 5b).

b) A controller (10) (CtD controller) which is connected to the common signaling channel (6) and which conducts on the common signaling channel (6) a control signal having the content that a connection is present on one information channel (5a) of the information channels (5a, 5b) in each case permanently allocated to one another, which connection must be switched through to one subscriber (7), and that a connection is present on the second information channel (5b) of the information channels (5a, 5b) permanently allocated to one another, which connection must be switched through to the second subscriber (8), and which forwards the terminal signaling of the connection to the first subscriber (7) to the connection to the second subscriber (8) and conversely.

10. The device as claimed in claim 9, characterized in that the controller (10) uses the signaling protocol according to the ITU-T signaling system No. 7.

11. The device as claimed in claim 10, characterized in that the controller (10) transmits the end-to-end signaling messages of the ISDN User Part (ISUP) from one connection to the other one and conversely.

12. The device as claimed in one of claims 9 to 11, characterized in that the inputs are those for PCM30 transmission links.

13. The device as claimed in one of claims 9 to 11, characterized in that the inputs are those for PCM24 transmission links.

14. The device as claimed in one of claims 9 to 13, characterized in that the controller (10) (CTD controller) is an existing controller of the transit exchange (3).

*(continued)*

15. The device as claimed in one of claims 12 to 14, characterized in that the transit exchange (3) is a transit exchange (3) of the EWSD system and the inputs are connected by two accesses for PCM lines (22) in each case being connected at one line trunk group (2) (LTG).

16. The device as claimed in claim 15, characterized in that the controller (10) (CTD controller) is the group processor of the line trunk group (2).

17. The device as claimed in one of claims 9 to 16, characterized in that the controller (10) is connected to a network server (13) which, in turn, is connected to another communication network in order to initiate the connection by a program on this network server (13) after a request from the other communication network.

18. The device as claimed in claim 17, characterized in that the other communication network is the Internet.

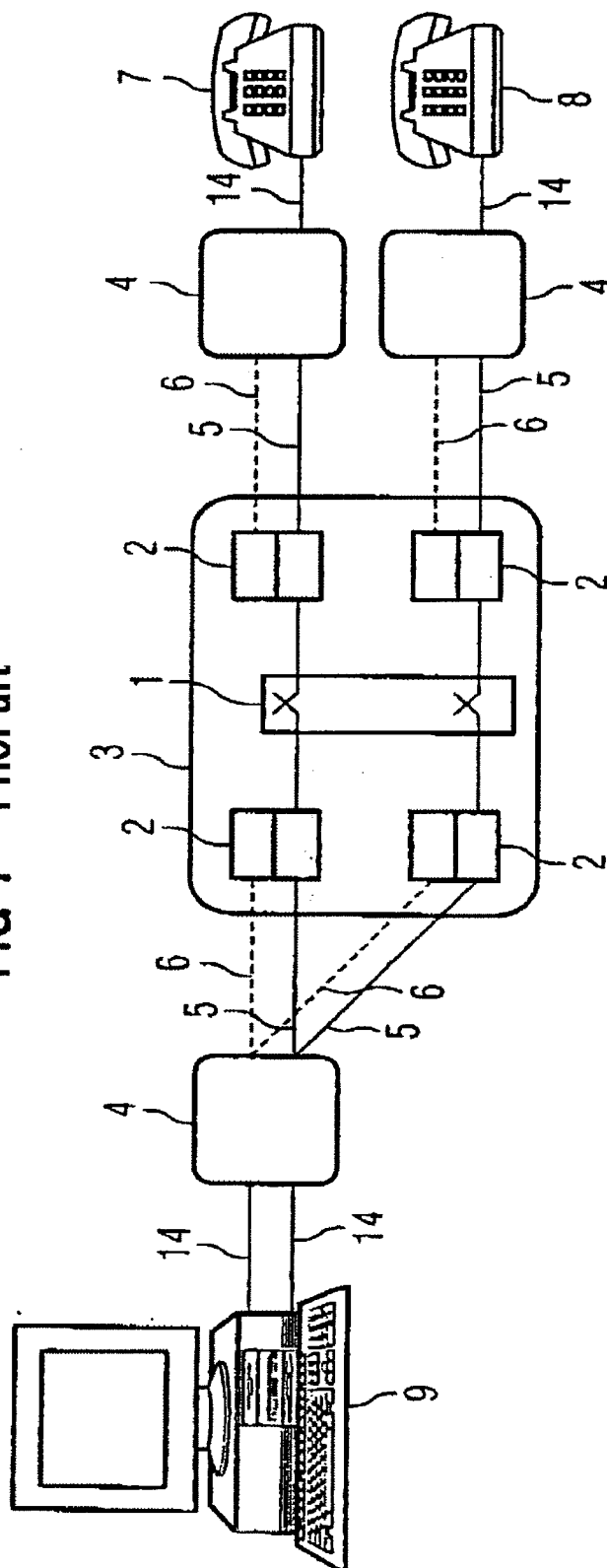
## Abstract

Method and device for switching a connection in a communication network

In a communication network with a common signaling channel which is independent of the information channels (5a, 5b, 5), two inputs for transmission links at a transit exchange (3) are connected by a data line (12). A controller (10), by means of a control signal on the common signaling channel (6), causes a connection to be switched through from one input to the first subscriber (7) and from the second input to the second subscriber (8). The terminal signaling of the connections to the subscribers (7, 8) is transmitted alternately.

Figure 2

FIG 1 Prior art



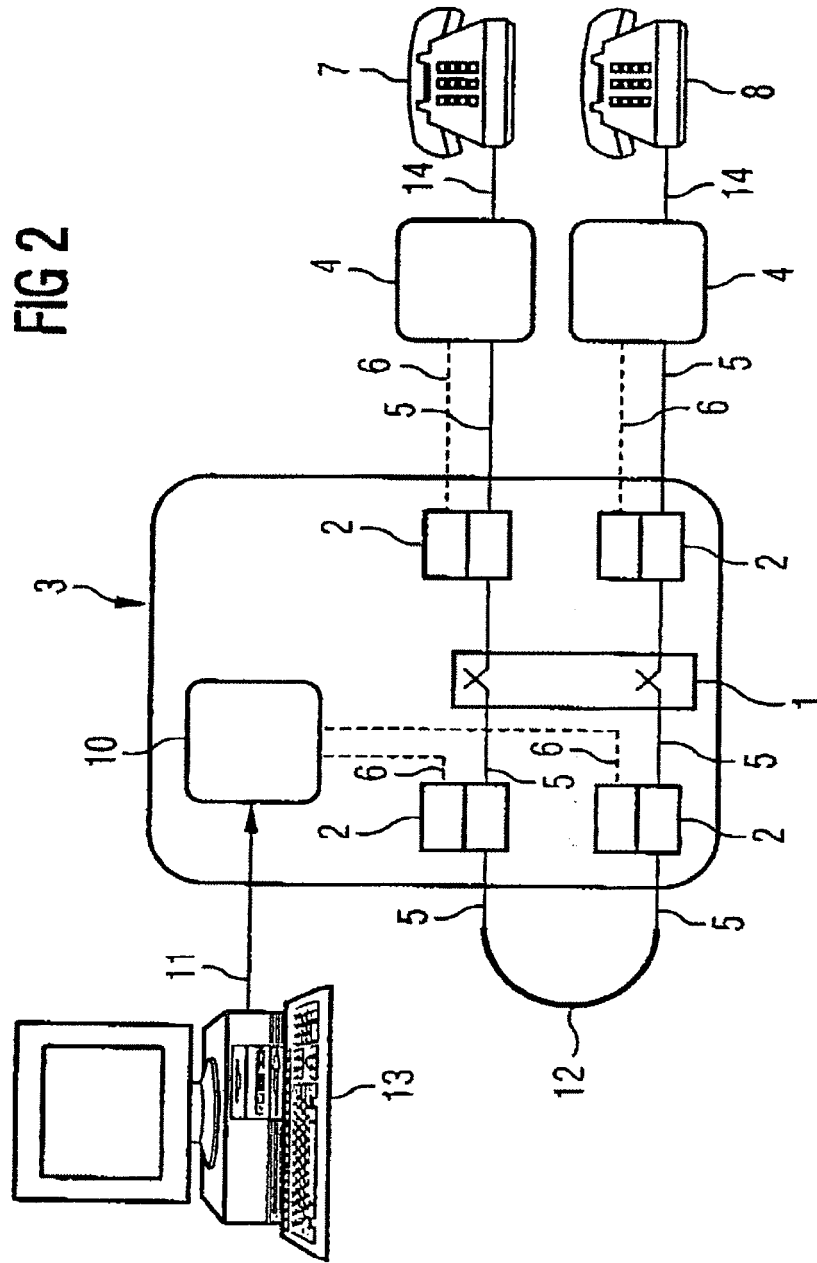
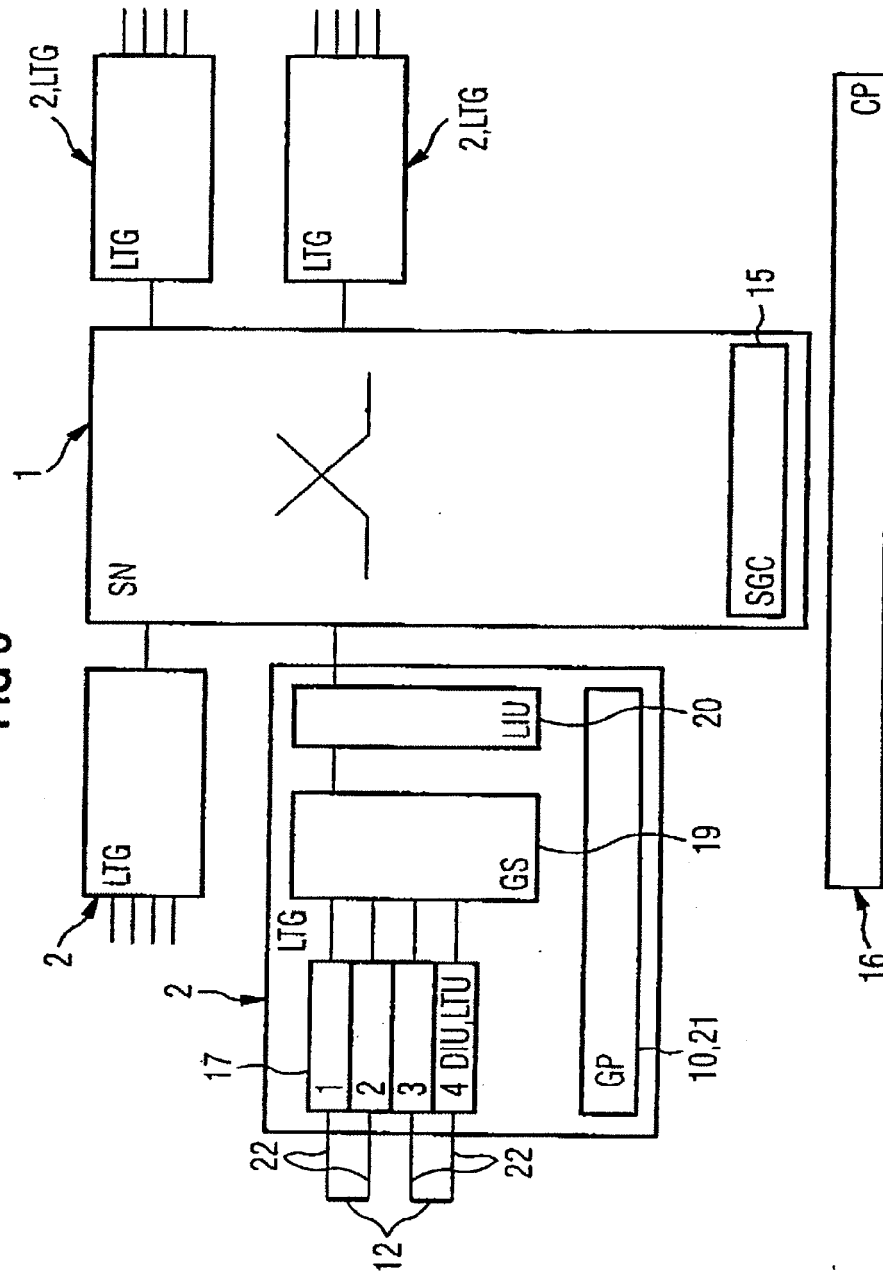


FIG 3



# Declaration and Power of Attorney For Patent Application

## Erklärung Für Patentanmeldungen Mit Vollmacht

### German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

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Verfahren und Vorrichtung zur Vermittlung einer Verbindung in einem Kommunikationsnetz

deren Beschreibung

(zutreffendes ankreuzen)

☐ hier beigefügt ist.

☒ am 25.09.2000 als

PCT internationale Anmeldung

PCT Anwendungsnummer PCT/DE00/03328

eingereicht wurde und am \_\_\_\_\_

abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Method and device for switching connections in a communication network

the specification of which

(check one)

☐ is attached hereto.

☒ was filed on 25.09.2000 as

PCT international application

PCT Application No. PCT/DE00/03328

and was amended on \_\_\_\_\_ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

# German Language Declaration

Prior foreign applications  
Priorität beansprucht

Priority Claimed

19946658.0

DE

29.09.1999

☒

☐

(Number)

(Country)

(Day Month Year Filed)

Yes

No

(Nummer)

(Land)

(Tag Monat Jahr eingereicht)

Ja

Nein

(Number)

(Country)

(Day Month Year Filed)

☐

☐

(Nummer)

(Land)

(Tag Monat Jahr eingereicht)

Yes

No

Ja

Nein

(Number)

(Country)

(Day Month Year Filed)

☐

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(Nummer)

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(Tag Monat Jahr eingereicht)

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No

Ja

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Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

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PCT/DE00/03328

(Application Serial No.)  
(Anmeldeseriennummer)

25.09.2000

(Filing Date D, M, Y)  
(Anmeldedatum T, M, J)

anhängig

(Status)  
(patentiert, anhängig,  
aufgegeben)

pending

(Status)  
(patented, pending,  
abandoned)

(Application Serial No.)  
(Anmeldeseriennummer)

(Filing Date D,M,Y)  
(Anmeldedatum T, M, J)

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# German Language Declaration

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Unterschrift des Erfinders	Datum	Second Inventor's signature	Date
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Wohnsitz		Residence	
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Staatsangehörigkeit		Citizenship	
DE		DE	
Postanschrift		Post Office Address	
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82110 Germering		82110 Germering	

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(Supply similar information and signature for third and subsequent joint inventors).